



How Automation Can Help Solve the Labor Shortage

AGENDA



- Why am I here and why did I agreed to speak?
- Background and Cross Company Overview
- Alarming Labor Statistics (Updated)
- What can we do to combat this rising labor shortages?
- Some Automation Assistance from Experience
- Open Discussion

WHY WE DO
WHAT WE DO

ABANDONED
MEAT PACKING
PLANT



Cross Company

Innovating the industrial world,
one customer at a time



Cross Company

- Founded in 1954 – Employee owned (ESOP) since 1979
- 650+ associates all focused on innovating the industrial world.....



Automation:
Automating Manual
Processes and
Making Machines
Better



Hose & Fittings:
Industrial and
hydraulic hose
assemblies for
mobile and in-plant
applications



**Precision
Measurement:**
Industrial
Measurement:
Calibration,
inspection, testing,
repair.
Design & Build
gaging, custom test
machines
Metrology
equipment sales

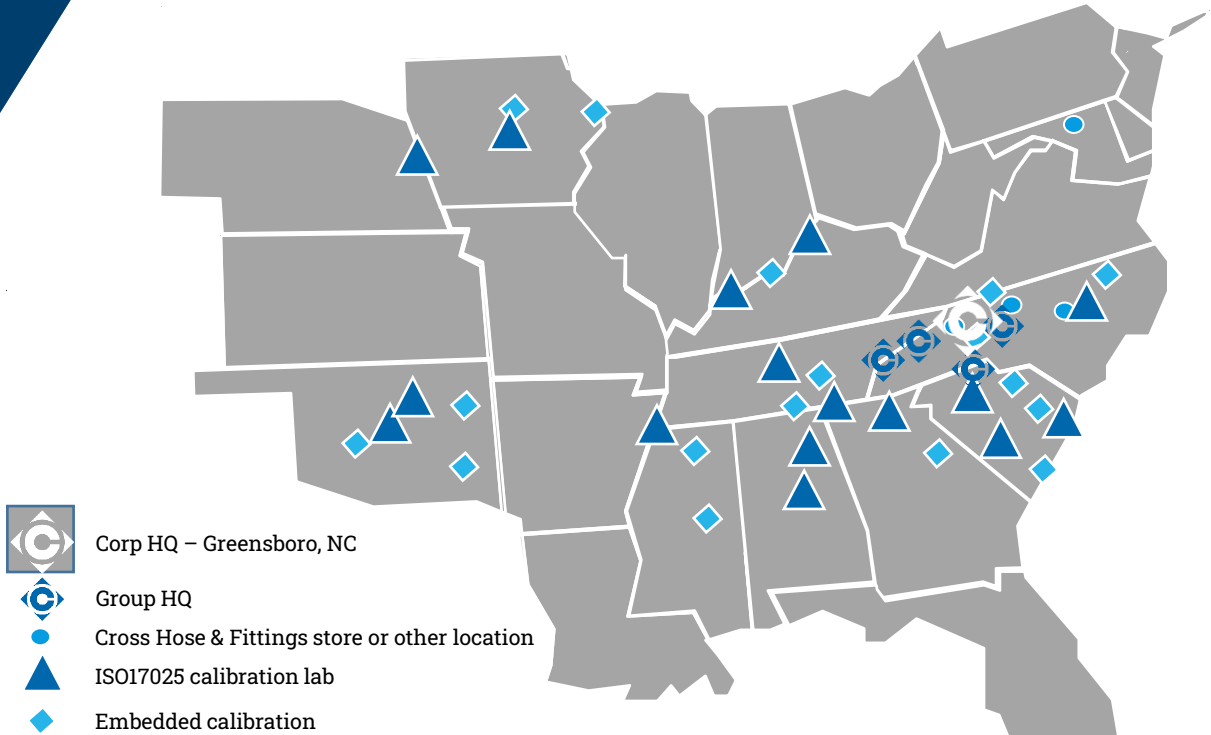







**Mobile Systems
Integration:**
Electrification,
Telematics,
Hydraulic
equipment, controls
and advanced
technology to the
mobile OEM market



**Process Solutions
Group:**
Instrumentation,
valve automation;
safety systems;
start-up,
commissioning, and
maintenance,
design and build
control systems

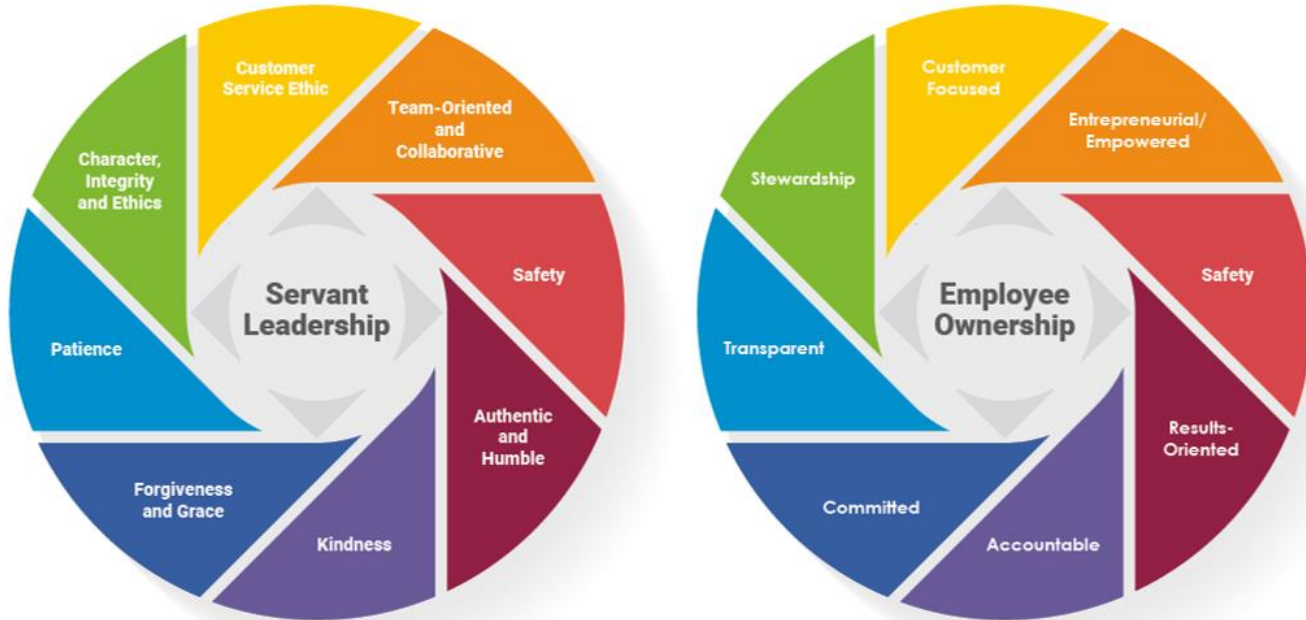
Locations



-  Corp HQ – Greensboro, NC
-  Group HQ
-  Cross Hose & Fittings store or other location
-  ISO17025 calibration lab
-  Embedded calibration



The cornerstones of our culture



INNOVATING THE INDUSTRIAL WORLD, ONE CUSTOMER AT A TIME.

Manufacturing automation experts partnering
with you to develop innovative solutions
backed by world-class customer service.



Automation

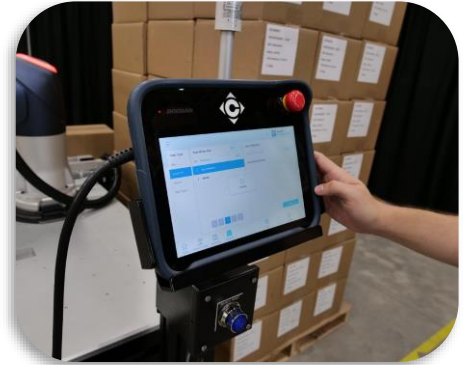
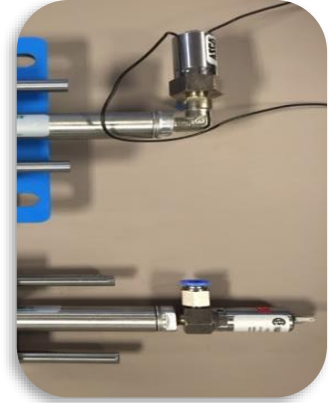
Capabilities

- Automation Machinery Builders

- Component supplier
- Obsolescence Management
- Design and build subassemblies

- End Users - Automating Manual Processes

- Turnkey solutions– work cell design and build
- Support –maintenance agreements, programming, onsite and in house repairs, training



Some Alarming Labor Statistics



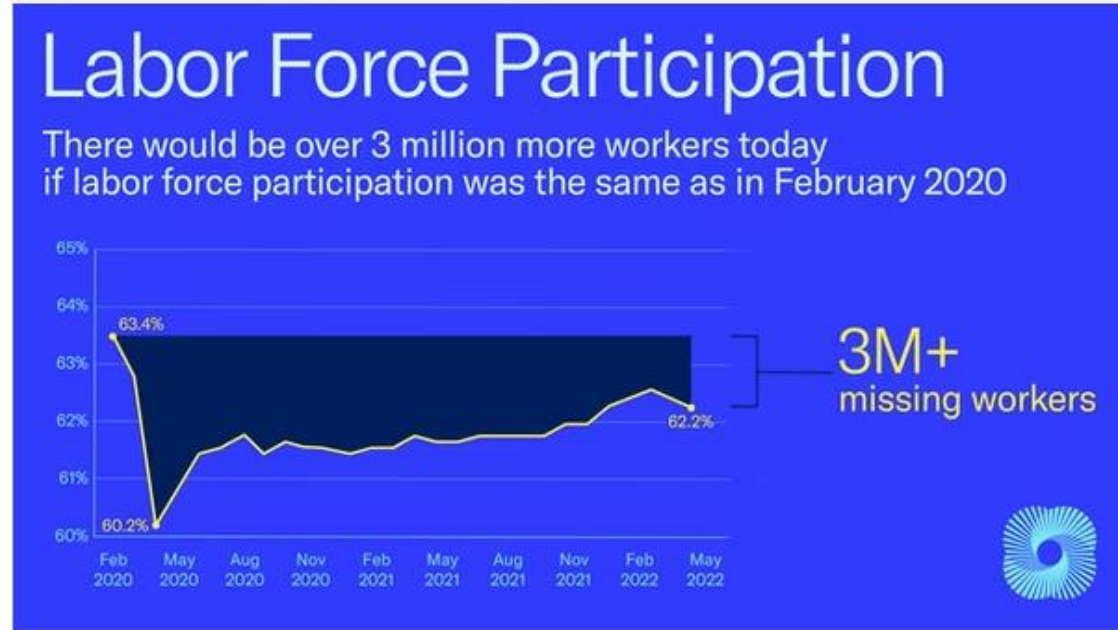
US Industrial Production

RATE-OF-CHANGE



Some Alarming Labor Statistics (2022)

- In March there were just under six million unemployed people seeking work.
- "The number of job openings rose to 11.5 million by the end of March — indicating there are close to two open jobs for every unemployed person.
- Chief U.S. economist at Oxford Economics stated "Anecdotally companies are still saying the biggest issue is a lack of available workers."



Some Alarming Labor Statistics

US Chamber of Commerce states

- “The labor force participation rates are unlikely to fully recover.
- In fact, experts estimate that the overall labor force participation rate will drop to 60.4% in 2030. Nearly three full percentage points less than the February 2020 rate”.



“The labor force participation rates are unlikely to fully recover.”

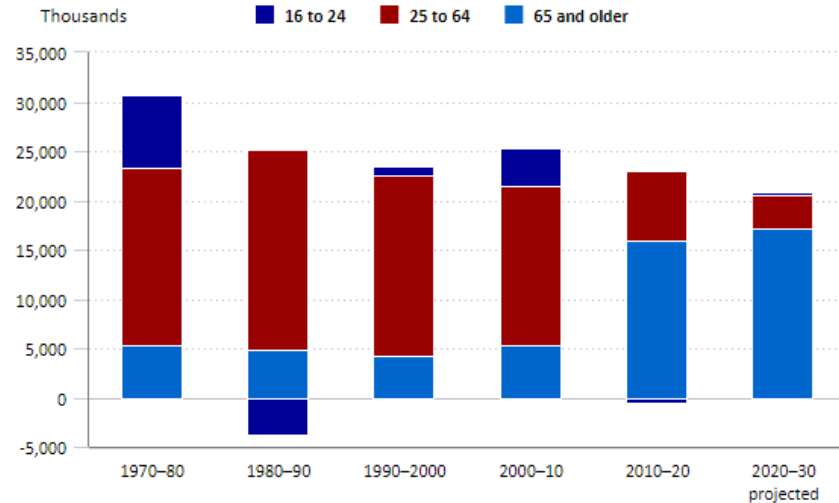
- 50% are not willing to take jobs that do not offer the opportunity for remote work.
- 20% have altered their livelihood
 - 17% have retired
 - 9% have transitioned to homemaker
 - 14% are now working part-time.
- 25% say government aid packages during the pandemic have incentivized them to not actively look for work.
- Younger respondents, aged 25-34, are prioritizing personal growth over searching for a job right now
 - 36% of younger respondents say they're more focused on acquiring new skills, education, or training before entering the job market
- Aging Population



Aging Population

- In the last 20 years - 117% increase in the number of workers aged 65 or older,
- Projected the the number of workers aged 55 and older will grow 3 times fast than workers aged 25-54.

Chart 2. Population change, by age group, for selected periods and 2020–30 projected



Click legend items to change data display. Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.



Another Big Factor for Mfg



- Globally, 16% of companies are fully remote
- By end of 2025 32.6 million Americans (22%) will work remote
- As of 2023, 12.7% of full-time employees work from home, while 28.2% work a hybrid model
- A staggering 98% of workers expressed the desire to work remotely, at least part of the time

Compounding the Problem

Reshoring

- A 2023 study of U.S. manufacturing executives by Forbes found that “82 percent of executives polled said they’d either moved overseas factories back home or were in the process of doing so.”
- Assembly Magazine stated - 7 percent of companies reshoring in 2012 to 91 percent in 2022.

Figure 1: Real Total Manufacturing Construction Spending

Billions of 2022 U.S. Dollars



Notes: Value of Private Construction Put in Place for Manufacturing, U.S. Census Bureau. Monthly at a seasonally adjusted, annualized rate. Nominal spending deflated by the Producer Price Index for Intermediate Demand Materials and Components for Construction, Bureau of Labor Statistics.

What Can We Do to Combat Labor Shortage?

- Recruit
- Retain
- Automate

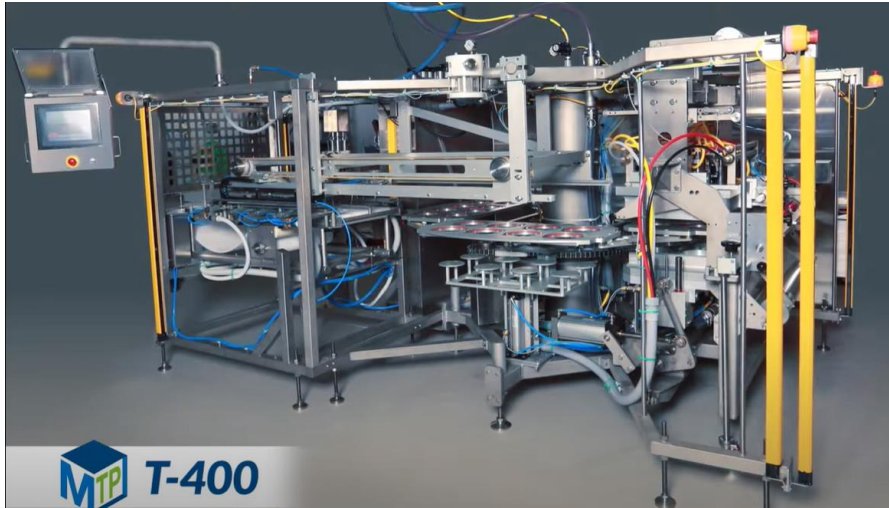


Flexible vs Fixed Automation



Fixed Automation

Fixed automation systems are used in manufacturing in order to perform a specific task or fixed sequence of processing operations.



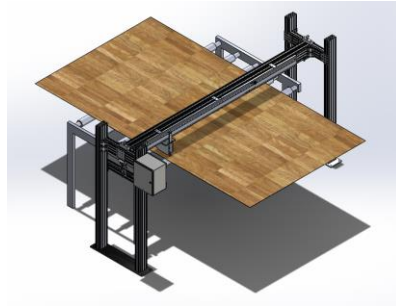
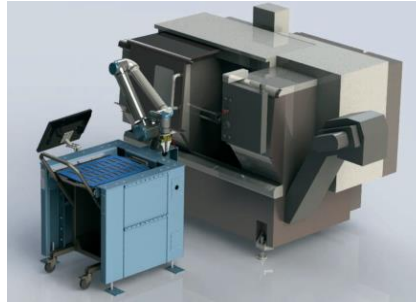
Flexible Automation

Flexible Automation is the ability for a robot or system to be quickly and easily re-tasked to change product design for both low and high mix manufacturing.

- Normally Lower Cost to Market
- Designed for Lower Volume Higher Mix
- ROI Ratio is Higher
- Less Complex and Less Gremlins

Examples of Flexible Automation

- Pick and Place
- Machine Tending
- Palletizing/De-palletizing
- Measurement, custom weighing, inspection (gauging, fixturing)
- Vision-based Inspection
- Sanding/Finishing
- Packaging



More Help Identifying Flexible Automation

Think About Undesirable Manual Tasks

Dirty Jobs - Dirty jobs are often unsanitary or hazardous work that can impact human health. One example is the need for sewer scrapers..

Dangerous Jobs Dangerous jobs put humans in harmful situations. To prevent the loss of human life, automation can be used.

Dull Jobs - Dull, low-interaction, high-repetition jobs require very little human thought. They often include processes that have a sole objective of efficiency and output. Automation systems can work around the clock to streamline dull jobs. This saves businesses money and frees up human capital for tasks that have an element of variety and a need for critical thinking



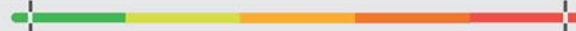
Major Considerations For Implementing Flexible Automation



1. Throughput

- Human speed not superhuman speed
- Look at parts per hour, day, week, to get overall cycle time
- Workers may work faster than normal when being watched
- Sweet spot:
 - Depends on process
 - Higher risk > 10 cycles/min

Simple



Advanced

Similar throughput
speed as human
workers

Higher speed
adds complexity
to risk assessment

2. Reach and Payload

- Avoid outer and inner reach envelope
- Save room for EOAT in total payload
- Consider that 2 robots may be better than a 7th axis

Simple



Advanced

Parts under
payload and
under robot reach

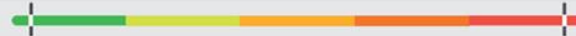
Moving robot for
additional reach
and multiple tasks

3. Parts and Presentation

- Parts in a repeatable position
- Low SKU's or part changeover
- Consider human interaction for staging of parts



Simple



Advanced

Consistent size and shape in ordered presentation

Unstructured presentation and overlapping parts



4. Collaborative with Humans

- Cobots are designed to work alongside humans **but** this can complicate safety and the risk assessment
- Answer can be as easy as plexiglass or slowing the robot down...
- Or as complicated as a complex array of safety sensors



Workers and cobot have defined spaces for interaction

Cobot speed, parts, or EOAT that require additional safety



5. Connectivity & Integration

- Does the machine communication fall into a standard protocol? (EIP, Profinet, Modbus, TCP/IP, or digital IO)
- PLC involved in Integration?
- What device controls the cell?
- Do you need to do external reporting? (MES, SCADA)

Simple



Advanced

Simple I/O
machine tie in.

Nonstandard protocol,
multiple machines and
external communication

6. Gripper & End Effectors

- Avoid task that need human dexterity
- Tool changers adds to complexity
- Buy not Build

Simple  Advanced

Consistent parts,
easy to pick up with
standard grippers

Variable part sizes
and shapes or
custom end effectors

7. Mounting & Fencing

- Footprint
- ensure stable, pinned mounting
- Mobility can be complex



Simple



Advanced

Robot mounted in one place at typical human speed

Robots moves, operates at high speeds, or requires additional safety precautions

8. Environment

- Best when working in standard human work environments
- If liquid or gas is involved check the MSDS
- Clean room and medical has its own challenges

Simple



Advanced

Standard work
environment for
human workers

Extreme
environments for
human workers

9. Programming and Logic

- Follow points 1-8 and this will be the easiest part
- Avoid trying to fix mechanical shortcomings through programming
- Vision systems, and force sensing can be complex

Simple



Advanced

Simple, consistent, pick and place process

Applications that require vision guidance, force, or safety-sensing



10. Future Needs

- Start easy then tackle the hard projects
- Don't forget about future needs, but don't let the distant future kill today's project
- Create a scope of work document to protect yourself against scope creep

Simple



Advanced

Today's
consistent
Processes

Future expectations
can lead to scope
creep

Major Considerations For Automating Undesirable Tasks

Throughput

Parts & Presentation

Connectivity & Integration

Mounting & Fencing

Programming & Logic



Reach & Payload

Collaborative with Humans

Gripper & End Effectors

Environment

Future Needs

What Can We Do to Combat Labor Shortage?

- Recruit
- Retain
- Automate

Questions or Emotional Statements?

